WHAT IS CLAIMED IS:

1. A method of monitoring an interferometer, comprising the steps of:

coupling a first optical signal into the interferometer and into a wavelength reference element,

detecting a first resulting interference signal being a result of interference of parts of the first optical signal in the interferometer,

detecting a resulting reference signal of the wavelength reference element, the resulting reference signal being a result of interaction of the first optical signal with the wavelength reference element, and

comparing the first resulting interference signal with the resulting reference signal to detect a drift of the interferometer, if any.

2. The method of claim 1, further comprising the steps of:

substantially permanently sweeping a wavelength of the first optical signal up and down.

3. The method of claim 1, further comprising the steps of:

substantially permanently sweeping a wavelength of the first optical signal up and down within a predetermined sweeping range.

4. The method of claim 1, further comprising the steps of:

substantially permanently sweeping a wavelength of the first optical signal up and down within a predetermined sweeping range, and

choosing the sweeping range in a way that it covers an absorption feature of the wavelength reference element.

5. The method of claim 1, further comprising the steps of:

locking the first optical signal to an absorption feature of the wavelength

reference element.

6. The method of claim 1, further comprising the steps of:

detecting a second resulting interference signal being a result of interference of parts of the first optical signal in the interferometer,

comparing the phase of the first and the second resulting interference signals to evaluate the direction of the drift.

7. The method of claim 1, further comprising the steps of:

locking the first optical signal to an absorption feature of the wavelength reference element,

coupling a second optical signal into the interferometer and into the wavelength reference element,

detecting a third resulting interference signal being a result of interference of parts of the second optical signal in the interferometer,

locking the second optical signal to a specified position, preferably to an extremum, of the third resulting interference signal, and

detecting a change of a beat signal of a superposition of the first and the second optical signal to detect the drift.

8. The method of claim 1, further comprising the steps of:

providing the first and the second optical signal with substantially the same polarization.

9. The method of claim 1, further comprising the steps of:

using the detected drift, if any, for stabilizing the interferometer.

10. The method of claim 1, further comprising the steps of:

coupling a third optical signal into the interferometer and into the wavelength reference element, the third optical signal having a wavelength substantially different from the wavelength of the first optical signal,

detecting a third resulting interference signal being a result of interference of parts of the third optical signal in the interferometer,

locking the third optical signal to an absorption feature of the wavelength reference element, and

comparing the first resulting interference signal with the third resulting interference signal to detect a wavelength dependency of the drift, if any.

11. The method of claim 1, further comprising the steps of:

using the detected drift, if any, for introducing a variable optical delay corresponding to the drift into the interferometer.

12. The method of claim 1, further comprising the steps of:

using the detected drift, if any, for evaluating a property of the interferometer or a device under test being part of the interferometer, the property being a dependency of at least one of the following: temperature, pressure, humidity, magnetism, voltage.

13. The method of claim 1, further comprising the steps of:

coupling a useful optical signal into the interferometer, and

detecting a useful resulting interference signal being a result of interference of parts of the useful optical signal in the interferometer for evaluating a wavelength of the useful optical signal.

14. The method of claim 1, further comprising the steps of:

coupling a useful optical signal into the interferometer along the same

path as the first optical signal and having a substantially orthogonal polarization with respect to a polarization of at least one of the following: the first optical signal, the second optical signal, the third optical signal, and

detecting a useful resulting interference signal being a result of interference of parts of the useful optical signal in the interferometer for evaluating the wavelength of the useful optical signal.

15. The method of claim 1, further comprising the steps of:

tuning the useful optical signal.

16. A software program or product, preferably stored on a data carrier, for executing the method of claim 1 when run on a data processing system such as a computer.

17. An apparatus for monitoring an interferometer, comprising:

a first coupler for coupling a first optical signal of a first optical source into the interferometer and into a wavelength reference element,

a first detector for detecting a first resulting interference signal being a result of interference of parts of the first optical signal in the interferometer,

a reference detector for detecting a resulting reference signal of the wavelength reference element, the resulting reference signal being a result of interaction of the first optical signal with the wavelength reference element, and

an evaluating unit for comparing the first resulting interference signal with the resulting reference signal to detect a drift of the interferometer, if any.

18. The apparatus of claim 17, further comprising:

a first locking circuit for locking the first optical signal to an absorption

feature of the wavelength reference element.

19. The apparatus of claim 17, further comprising:

a second detector for detecting a second resulting interference signal being a result of interference of parts of the first optical signal in the interferometer,

the evaluation unit being designed for comparing the phase of the first and the second resulting interference signals to evaluate the direction of the drift.

20. The apparatus of claim 17, further comprising:

a first locking circuit for locking the first optical signal to an absorption feature of the wavelength reference element,

a second coupler for coupling a second optical signal of a second optical source into the interferometer and into the wavelength reference element,

a third detector for detecting a third resulting interference signal being a result of interference of parts of the second optical signal in the interferometer ,

a second locking circuit for locking the second optical signal to a specified position, preferably to an extremum, of the third resulting interference signal, and

a fourth detector for detecting a change of a beat signal of a superposition of the first and the second optical signal to detect the drift.

21. The apparatus of claim 17, further comprising:

the first and the second coupler comprising the same polarization beam splitter for providing the first and the second optical signal with substantially the same polarization.

22. The apparatus of claim 17, further comprising:

a stabilizing unit for stabilizing the interferometer on the basis of the drift detected by the evaluation unit.

23. The apparatus of claim 17, further comprising:

a third coupler for coupling a third optical signal into the interferometer and into the wavelength reference element, the third optical signal having a wavelength substantially different from the wavelength of the first optical signal,

a fifth detector detecting a third resulting interference signal being a result of interference of parts of the third optical signal in the interferometer,

a third locking circuit for locking the third optical signal to an absorption feature of the wavelength reference element, and

the evaluation unit being designed for comparing the first resulting interference signal with the third resulting interference signal to detect a wavelength dependency of the drift, if any.

24. The apparatus of claim 17, further comprising:

a variable optical delay unit for introducing a variable optical delay into the interferometer on the basis of the drift detected by the evaluation unit.

25. The apparatus of claim 17, further comprising:

the evaluating unit being designed to evaluate a property of a device under test being part of the interferometer, the property being dependent on at least one of the following: temperature, pressure, humidity, magnetism, voltage.

26. The apparatus of claim 17, further comprising:

a fourth coupler for coupling a useful optical signal of a fourth optical

source into the interferometer,

a sixth detector for detecting a useful resulting interference signal being a result of interference of parts of the useful optical signal in the interferometer, and

the evaluating unit being designed to evaluate a wavelength of the useful optical signal.

27. The apparatus of claim 17, further comprising:

a polarization beam splitter for coupling a useful optical signal of a fourth optical source into the interferometer with a polarization orthogonal to a polarization of at least one of the following: the first optical signal, the second optical signal, the third optical signal,

a seventh detector for detecting a useful resulting interference signal being a result of interference of parts of the useful optical signal in the interferometer, and

the evaluation unit being designed for evaluating the wavelength of the useful optical signal.

28. The apparatus of claim 17, further comprising:

the fourth optical source being a tunable laser source.